

CLAIMS

1. A pn-junction compound semiconductor light-emitting device comprising a stacked structure including a light-emitting layer composed of an n-type or a p-type aluminum gallium indium phosphide and a light-permeable substrate for supporting the stacked structure, the stacked structure and the light-permeable substrate being joined together, characterized in that the stacked structure includes an n-type or a p-type conductor layer, and that the conductor layer and the substrate are joined together, and the conductor layer is composed of a Group III-V compound semiconductor containing boron.
2. The pn-junction compound semiconductor light-emitting device according to claim 1, wherein the conductor layer has a bandgap at room temperature which is greater than that of the light-emitting layer.
3. The pn-junction compound semiconductor light-emitting device according to claim 1 or 2, wherein the conductor layer is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added.
4. The pn-junction compound semiconductor light-emitting device according to any one of claims 1 to 3, wherein the conductor layer is composed of a Group III-V compound semiconductor containing arsenic and boron.
5. The pn-junction compound semiconductor light-emitting device according to

any one of claims 1 through 4, wherein the conductor layer is composed of a Group III-V compound semiconductor containing phosphorus and boron.

6. The pn-junction compound semiconductor light-emitting device according to claims 5, wherein the conductor layer is composed of boron phosphide.

7. The pn-junction compound semiconductor light-emitting device according to any one of claims 1 through 6, wherein the conductor layer is composed of a boron-containing Group III-V compound semiconductor containing twins.

8. The pn-junction compound semiconductor light-emitting device according to claim 7, wherein each of the twins has, as a twinning plane, a (111) lattice plane of a boron-containing Group III-V compound semiconductor.

9. A method for producing a pn-junction compound semiconductor light-emitting device comprising the steps of:

forming a stacked structure through sequentially stacking on a crystal substrate a lower cladding layer, a light-emitting layer composed of n-type or p-type aluminum gallium indium phosphide, an upper cladding layer, and an n-type or a p-type conductor layer composed of a boron-containing Group III-V compound semiconductor, and a step of joining the conductor layer to a light-permeable substrate.

10. The method for producing a pn-junction compound semiconductor light-emitting device according to claim 9, wherein the crystal substrate is removed

after joining of the conductor layer to the light-permeable substrate.

11. The method for producing a pn-junction compound semiconductor light-emitting device according to any one of claims 9 and 10, wherein the conductor layer is formed through crystal growth at a growth rate of 20 nm/min to 30 nm/min until the conductor layer thickness reaches 10 nm to 25 nm, followed by crystal growth at a growth rate less than 20 nm/min until the conductor layer comes to have a thickness of interest.